

REMARKS

The above amendments and following remarks are responsive to the points raised in the September 7, 2005 non-final Office Action. Upon entry of the above amendments, Claims 1 and 7-10, new Claims 18-25 will have been added, and Claims 1-25 will be pending. No new matter has been introduced. Entry and reconsideration are respectfully requested.

Response to Claim 7 Objection

Claim 7 has been objected to of the basis that the recited language of “a plurality of number of times’ or ‘a number of time’.”

Claim 7 has been amended to obviate the Examiner’s objection.

Accordingly, the objection of Claim 7 is now moot and should be withdrawn.

Response to the Rejection Under 35 § U.S.C. 102(e)

Claims 1, 6-8, and 13-15 have been rejected under 35 U.S.C. § 102(e) as being unpatentable over US Patent 6,517,183 to Bruch et al. (Bruch). Applicant traverse this rejection.

In the Action, the Examiner stated that Bruch et al. discloses a calculation step of calculating a threshold in column 6, lines 15-17, and column 11, lines 30-35. However, Bruch determines a threshold level which lies outside the range of the natural variability of the measured peak-to-peak amplitude variation of the variability in the noise introduced into a system including a photo diode 560 and an amplifier 510. The peak-to-

Amendment

peak signal corresponds to a difference a highest number and a lowest number of counts that is a quantization unit of current or voltage of the photo diode 560. In other words, we believe that Bruch , in advance, determines the threshold level corresponding to the system including a photo diode 560 and an amplifier 510. Accordingly, we consider that the threshold level has been adopted in the measurement using the system.

On the contrary, according to the present invention, each of nozzles of the head is driven to discharge liquid droplets and a discharging state from each nozzle of the head is detected and stored as a physical amount in a memory. Then, an average value and a standard deviation of the physical amounts in the memory are calculated and a threshold is obtained on the basis of the average value and the standard deviation, and it is determined based on the threshold whether the discharging state from each of nozzles of the head is normal or abnormal.

According to the present invention recited in claims 1 and 8, since the threshold value is separately determined for each head, discharging state from each nozzle of each head is correctly determined. New Claims 22 and 24 correspond to claims 1 and 8, respectively, except for that “average” is changed into “median”. This is supported by a description on page 27, lines 5-10 in the specification. New dependent claims are supported by a description on page 26, lines 16-21 in the specification. As such, the subject matter of Claims 1, 6-8, 3-15, 18, 19, 22-24 are distinguished over Bruch.

Accordingly, the rejection under 35 U.S.C. § 102(e) over Bruch should be withdrawn.

Response to the Rejections Under 35 § U.S.C. 103(a)

Claims 2-4, 9-11, 16, and 17 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Bruch in view of US Patent 6,752,483 Vega et al. (Vega) Claims 5 and 12 have been rejected under 35 U.S.C. § 103(a) as being obvious over Bruch in view of US Patent 6,419,341 Nohata et al. (Nohata) Applicant traverses these rejections.

Applicant respectfully submits that neither Bruch, Vega, nor Nohata, either alone or in combination, teach, suggest, or otherwise render obvious, the subject matter recited in Claims 2-5, 9-12, 16, 17, 20, and 21.

In regard to Claims 9 and 10, at least two thresholds are obtained as in the way as in Claims 1 and 8, and one of the thresholds is for determining as normal and another is for determining as abnormal. As the result, if the physical amount of the nozzle lies between the one and another thresholds, then a discharging state of the nozzle is not determined. In such case, a new threshold is again determined for the undetermined nozzle, and the discharging state of the undetermined nozzle is determined whether non-defective or defective. Dependent Claims 2-4 include at least two thresholds for determining whether or not normal, or abnormal, or non-defective, or defective, discharging state of each nozzle. Applicant respectfully submit that Bruch and/or Vega advances any teaching or suggestion that would have motivated one of ordinary skill in the art, at the time the invention was made, to modify Bruch in view of Vega as suggested by the Examiner. As such, the subject matter recited in Claims 2-4, 9-11, 16, and 17 is distinguished over Bruch and Vega, either alone or in combination.

Dependent Claims 5 and 12, which are dependent upon Claims 1 and 8, respectively, recite that the physical amount includes droplet discharging time. Applicant respectfully submits that Bruch and/or Nohata advances any teaching or suggestion that would have motivated one of ordinary skill in the art, at the time the invention was made, to modify Bruch in view of Nohata as suggested by the Examiner. As such, the subject matter recited in Claims 5 and 12 is distinguished over Bruch and Nohata, either alone or in combination. As such, the subject matter recited in Claims 5 and 12 is distinguished over Bruch and Nohata, either alone or in combination.

Accordingly, the rejections under 35 U.S.C. § 103(a) should be withdrawn.

CONCLUSION

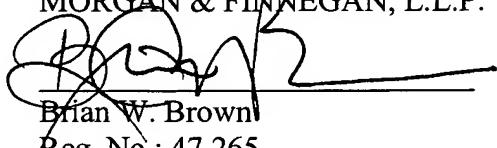
Applicants respectfully submit that Claims 1-25 are in condition for allowance and a notice to that effect is earnestly solicited.

AUTHORIZATIONS:

The Commissioner is hereby authorized to charge any additional fees which may be required for the timely consideration of this amendment, or credit any overpayment to Deposit Account No. 13-4500, Order No. 1232-5200.

Respectfully submitted,
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Date: December 7, 2005

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